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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,298	05/31/2007	Shinichi Wada	L5085.07120	9228

52989 7590 05/29/2008

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EXAMINER	
KIM, JOHN K	

ART UNIT	PAPER NUMBER
2834	

MAIL DATE	DELIVERY MODE
05/29/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,298	WADA ET AL.	
	Examiner	Art Unit	
	JOHN K. KIM	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/13/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action is in response to papers filed on 27 March 2008. Amendments made to the claims and Applicant's remarks have been entered and considered.

2. Claims 1-12 are pending and are presented for examination. Claims 1-2 have been amended, and claim 6 has been cancelled.

Response to Arguments

3. Applicant's arguments filed 27 March 2008 have been fully considered.

4. Objection to drawing, specification and claim rejection under 35 U.S.C. 112 are withdrawn as they have been amended or explained. The examiner appreciates the kind explanation showing with sketch.

5. Arguments to claim rejections under 35 U.S.C. 102b and 103 have been fully considered.

The examiner sees no critical remarks for the original rejections. However, the applicant remarks with the amended claim. Regarding to the applicant's remarks for amended claim, Fig. 1A of Exhibit 2 illustrates an expanded view of shaft 1, rotor frame 2, and compared with the bearing space within Fukutani's Fig. 2. It is true that as may be determined by inspection of Fig. 1 of Exhibit 2 and Fig. 1 of the application, the claimed structure for the rotor frame provides an advantageously larger bearing space 225 for accommodating the upper portion of bearing 231, and thus, bearing 231 may be thicker with the claimed structure than can Fukutani's bearing 5, which is beveled at its

upper portion (see Fukutani's Fig. 2). However, Fukutani shows Figs. 3-7 as well where the rotor frame (31) provides an advantageously larger bearing space for accommodating the upper portion of bearing 37.

Regards claim 7-8 and 10-11, the examiner agrees that the secondary references, Kobayashi al (US 2005/0285473) and Tamaoka (US 2007/0007841), are teaching the subject matters but the dates are not proper. Hence, rejection for those claims was not proper. Therefore, the examiner redoes the examination as second non-final rejection.

Response to Amendment

6. The claims 1 and 2 are amended but part of claim 2 has been moved to claim 1. Therefore, substantially, the contents of claims 1 and 2 as a whole are considered not being changed. However, since claims 1-2 are amended and prior arts for claims 7-8, 10-11 were not properly cited, claims are re-worked with new prior arts. The rejections are below.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-3 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutani et al (US 6700256) in view of Higuchi (US 6339273).

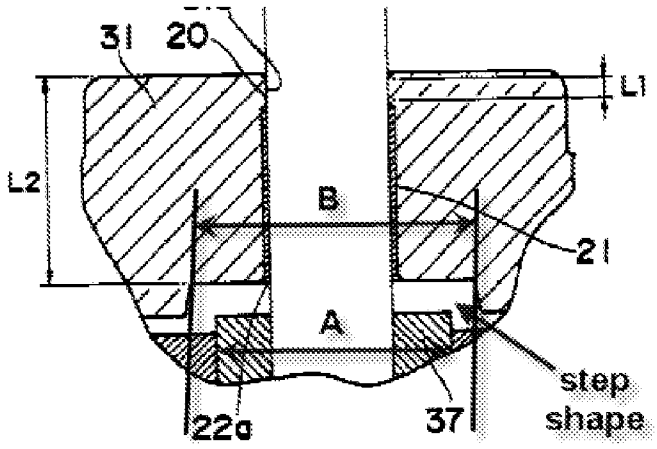
As for claim 1, Fukutani teaches (in Figs. 1 and 3) a disk apparatus comprising a rotor frame in which disk holding member (17) is placed on a center of an upper surface of rotor frame (2), a shaft (1) mounted on a center of said rotor frame, a bearing metal (5) which holds said shaft, a holder (9) which is disposed on an outer periphery of said bearing metal (5) and which holds said bearing metal, a stator (14) disposed on an outer periphery of said holder (9), a magnet (3) fixed to said rotor frame (2) at a location opposed to said stator (14), and a thrust cap (8) fixed to a center of a lower portion of said holder (9), in which an outer periphery of the lower portion of said holder is swaged and fixed to a motor plate (11), and said shaft (1) is disposed between said disk holding member (17) and said thrust cap (8), wherein said rotor frame (2) at the location opposed to said bearing metal (5) is projected toward said disk holding member (17),

thereby forming a bearing metal space (space between 2 and 9 near to the shaft 1) in a lower portion of a center of said rotor frame (2), and an upper end of said bearing metal (5) is brought closer to said rotor frame (2).

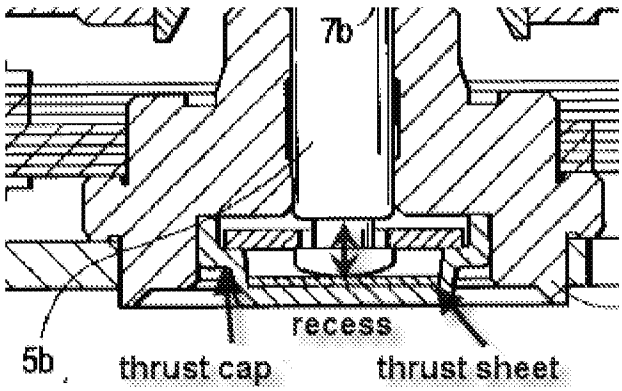
Fukutani further teaches (in Figs. 3-7 and sketch below) said bearing metal space (space between 31 and 37) is formed by forming a surface constituting said rotor frame (31) into a step shape (see sketch below), but failed to teach a size of said bearing metal space in its radial direction is greater than a size of said bearing metal in its radial direction at lower part of the bearing metal.

In the same field of endeavor, Higuchi teaches (in Fig. 4) a size of bearing metal space (between 7 and 5a) in its radial direction is greater than a size of said bearing metal (5a) in its radial direction.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Higuchi with that of Fukutani for lubrication. (col. 8, line 61-65)



As for claim 2, Fukutani and Higuchi clearly show and disclose the claimed invention as applied to claim 1 above. Higuchi further teaches (in Fig. 1 and sketch below) a recess is formed in thrust cap at a location opposed to shaft (5b).



As for claim 3, Fukutani and Higuchi teach the claimed invention as applied to claim 2 above. Higuchi further teaches (in Fig. 1 and sketch above) a protrusion is formed on a center of a lower end surface of shaft (5b), and a protrusion projecting toward said shaft (5b) is formed on a center of the recess of thrust cap at a location opposed to said shaft (5b).

As for claim 7, Fukutani and Higuchi clearly show and disclose the claimed invention as applied to claim 2 above. Higuchi further teaches a coating with fluorine for smooth circulation of lubrication oil into the bearing. (col. 8, line 61-65). Higuchi, however, failed to teach the coating is applied on an upper surface of the recess of said thrust cap or a lower end surface of said shaft. However, it is notoriously old and well known in the art to apply lubrication on those rotational friction spots, and therefore the examiner hereby takes official notice regarding the location of the fluorine coating.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to improve the circulation of lubrication.

As for claim 8, Fukutani and Higuchi clearly show and disclose the claimed invention as applied to claim 1 above. Higuchi further teaches or suggests (in Fig. 4) a recess (at 4a below 4d) is formed in a motor plate (4a) at a location corresponding to a convex portion of an insulator of a coil (4d) constituting stator (4).

As for claim 9, Fukutani and Higuchi clearly show and disclose the claimed invention as applied to claim 1 above. Fukutani further teaches (in Fig. 1) a thickness of a projection (16) of rotor frame (2) located above bearing metal (5) is made thinner than a basic thickness of rotor frame (2). Projection of rotor frame by drawing or crushing operation is a product by process limitation whose patentable weight is very little.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutani et al (US 6700256) in view of Higuchi (US 6339273) and further in view of Shiraki et al (US 6465927).

Fukutani and Higuchi clearly show and disclose the claimed invention as applied to claim 2 above. Higuchi further teaches (in Figs. 1 and 4) a lower end surface of shaft (5b) is formed into a spherical shape, thereby forming protrusion, but failed to teach an upper surface of the recess of thrust cap is formed into a spherical shape, thereby forming protrusion. In the same field of endeavor, Shiraki teaches (in Fig. 5) an upper

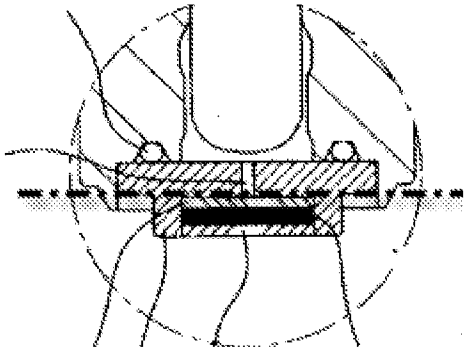
surface of the recess of thrust cap (3) is formed into a spherical shape, thereby forming protrusion. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to make the shape of protrusions at the lower end of the shaft and the thrust cap by combining the teachings of Shiraki with those of Fukutani and Higuchi to avoid an necessary friction at the contact of bearing tip and cap.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutani et al (US 6700256) in view of Higuchi (US 6339273) and in further view of Kim (US 2004/0032176).

Fukutani and Higuchi clearly show and disclose the claimed invention as applied to claim 2 above. None of above prior arts, however, teaches a lower end surface of said thrust cap by said recess has the same height as that of a lower end surface of the swaging portion of the thrust cap of said holder.

In the same field of endeavor, Kim teaches (in Fig. 3) a lower end surface of cap (16) by recess has the same height as that of a lower end surface of the swaging portion of the cap of holder. (see bold dash line in sketch below)

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to make the bottom recess height same as the lower end surface of the swaging portion of thrust cap by combining the teachings of Kim with those of Fukutani and Shiraki to reduce the height of the motor.



Sketch for claim 5

11. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutani et al (US 6700256) in view of Higuchi (US 6339273) and in further view of Obara (US 6538354).

As for claims 10 and 11, Fukutani and Higuchi clearly show and disclose the claimed invention as applied to claim 1 above. References, however, failed to teach an outer side of motor plate being projected toward rotor frame. In the same field of endeavor, Obara teaches or suggests (in Fig. 1a) a side of motor plate (2) located outside from an outer periphery of rotor frame (5) is projected toward said rotor frame.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to project an outer side of motor plate toward rotor frame by combining the teachings of Obara with those of Fukutani and Higuchi to reduce the thickness of disk driver by mounting the motor at above the motor bottom.

12. Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutani et al (US 6700256) in view of Higuchi (US 6339273) and in further view of Karidis (US 4712027).

As for claim 12, Fukutani and Higuchi clearly shows and discloses the claimed invention as applied to claim 1 above. Fukutani, however, failed to teach rotor frame is subjected to nitrogen processing. In the same field of endeavor, Karidis teaches or suggests rotor frame is subjected to nitrogen processing. (col. 9, line 50-57)

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform nitrogen process for the rotor frame by combining the teachings of Karidis with that of Fukutani to locally change the magnetic property of the rotor frame steel.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN K. KIM whose telephone number is (571)270-5072. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JK

/Darren Schuberg/

Supervisory Patent Examiner, Art Unit 2834